a liquid crystal panel comprising a liquid crystal held between a pair of substrates; and

an illumination device for supplying light to the liquid crystal panel;

wherein the illumination device comprises a light source device which emits light, and a light guide having a light receiving plane which receives light from the light source device and a light exiting plane which exits the light; and

the light source device comprises a light emitting device, and a lens which receives the light emitted from the light emitting device;

wherein the lens has a planar light incidence plane and a non-planar light exiting plane having a shape in which a height from the light incidence plane changes in one direction, while a height from the light incidence plane light incidence plane is constant in a direction perpendicular to the one direction, the one direction being set to a height direction of the light guide, and the perpendicular direction being set to a width direction of the light guide.

11. (Amended) The liquid crystal device according to Claim 8, wherein the lens is provided adjacent the light receiving plane of the light guide, for condensing light.

15. (Amended) The illumination device according to Claim 5, wherein the lens is provided adjacent the light receiving plane of the light guide, for condensing light.

17. (Amended) The liquid crystal device according to Claim 9, wherein the lens is provided adjacent the light receiving plane of the light guide, for condensing light.

REMARKS

Claims 1-18 are now pending in the application. The Examiner is

respectfully requested to reconsider and withdraw the rejections in view of the amendments and remarks contained herein.

REJECTION UNDER 35 U.S.C. § 102

Claims 1-3 and 13 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Aoyama (U.S. Pat. No. 6,250,777). This rejection is respectfully traversed.

Claim 1 calls for a lens having a property that provides directivity of exiting light in one direction that is higher than directivity of exiting light in a direction perpendicular to the one direction. As illustrated in Figs. 7a-7c, this is preferably provided by forming the lens 44a in a semi-circular pillar shape, a prismatic shape, or a partial circular pillar shape having a Fresnel lens surface. In contrast, the '777 reference discloses a double-focus lens 10 including double-focus lens cuts 11.

The double-focus lens cuts 11 include convex cuts 11a and concave cuts 11b. As such, the lens 10 is generally shaped as a saddle. The convex cuts 11a diffuse light at an angle alpha. The concave lens cuts 11b diffuse light at an angle beta. The angle alpha and the angle beta can be set at substantially the same angle such that the double focus lens cuts 11 perform similar to a conventional convex or concave lens. Due to this, the '777 reference teaches that even though the focal points f1 and f2 may be located in two places: in front of the lens 10 and in back of the lens 10, the "directivity" of the exiting light remains substantially equal.

This is in contrast to the claimed invention wherein the exiting light has essentially no directivity in the x direction and high directivity in the y direction. Namely, the claimed lens causes scattered light to exit in a wide angular range in the x direction,

and causes condensed light with high intensity to exit in a limited narrow angular range in the y direction. While the '777 reference provides an arrangement that exhibits a feeling of depth, the disclosed arrangement does not provide the claimed "directivity". The relevant disclosure of the '777 reference can be found in column 3, lines 11-52 and a description of the claimed directivity can be found in paragraphs 44-53 of applicant's specification as filed.

Claim 1 and claim 2, call for a lens having a planar light incident plane (nearest the light source) and a non-planer light exiting plane (farthest from the light source). In contrast, as shown in Fig. 4 of the '777 reference, the prior art shows a lens 10 having a non-planar light incident plane and a planar light exiting plane. This is the opposite of the claimed arrangement.

Claim 2 also calls for the non-planar light exiting plane to have a shape in which a height from the light incident plane changes in one direction while a height from the light incident plane is constant in a direction perpendicular to the one direction. As described above, this arrangement is preferably provided as illustrated in Figs. 7a-7c in the form of a semicircular pillar shape, a prismatic shape, or a partial circular pillar shape having a Fresnel lens surface. Referring particularly to Fig. 7, as one moves in the direction y along the light incident plane 44d, the height of the light exiting plane 44a relative thereto changes. However, when one moves in the direction x along the light incident plane 44d, the height of the light exiting plane 44a relative thereto remains constant.

In contrast, the double-focus lens cuts 11 of the '777 reference include convex cuts 11a and concave 11b such that the cuts 11 are generally saddle shaped.

As such, the height of the non-planar surface relative to the planar surface changes in both the direction of the convex cuts 11a and in the direction of the concave cuts 11b perpendicular thereto. Inasmuch as the non-planar surface of the '777 reference changes in both directions, this construction cannot anticipate the subject matter of claim 2.

With respect to claims 3 and 13, a lens is called for having any one of a semicircular pillar shape, a prismatic shape, or a partial circular pillar shape having a Fresnel lens surface. Examples of these shapes are illustrated in Figs. 7a-7c, respectively. In contrast, the lens 10 of the '777 reference has a double-focus lens cut 11 with convex cuts 11a and concave 11b thereby yielding a generally saddle shape. Such a saddle shape is not anyone of the claimed semicircular pillar shape, prismatic shape, or a partial circular pillar shape having a Fresnel lens surface. Accordingly, the '777 reference cannot anticipate the subject matter of claims 3 or 13.

Claims 4-7, 14 and 15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Saito (U.S. Patent No. 5,890,791). These rejections are respectfully traversed.

Regarding claim 4, a light source device is called for comprising a light emitting device and a lens which receives the light emitted from the light emitting device. Also, a light guide is called for that receives the light from the light source device. As illustrated in Fig. 2 of applicant's specification, the light source device 21 includes a light emitting device 43 and a lens 44a which receives the light emitted from the light emitting device 43. A light guide 4 is disposed adjacent the light source 21 and includes a light receiving plane which receives light from the light source device.

In contrast, the '791 reference teaches a light source 11 in the form of a cold-cathode tube. A light guide 12 is positioned proximate the light source 11. The light guide 12 includes projections 12b formed on a transmission surface 12a of the light guide 12. The light source 11 does not include a lens which receives light emitted from a light emitting device. The light source 11 only comprises a light emitting device. No lens is provided. The office action states that the light source device 11 includes a light emitting device in the form of a transmission surface 12a. However, as stated above, the transmission surface 12a is formed on the light guide 12. The office action fails to identify a component within the '791 reference comprising the claimed lens. It is assumed that the examiner is interpreting the projections 12b of the light guide 12 as the claimed lens. However, such projections 12b are formed on the light guide 12 which is claimed as a separate and distinct component from the claimed light source. It should also be noted that element 13 of the '791 reference is a light control sheet that illuminates the liquid crystal display element 14. Such a light control sheet cannot reasonably be interpreted as a light guide especially when the light guide 12 is provided for working in conjunction with the light control sheet 13.

In view of the foregoing, it can be appreciated that the '791 reference fails to teach a light source device comprising a light emitting device and a lens which receives the light emitted from the light emitting device as claimed. As such, the '791 reference cannot anticipate the subject matter as claimed. The relevant portions of the '791 reference can be found, at least, at column 6, lines 14-26 and Fig. 1.

Regarding claim 5, a light source device is called for which comprises a light emitting device and a lens which receives the light emitted from the light emitting

device. A separate light guide is provided having a light receiving plane which receives the light from the light source device. These recitations are identical to those found in claim 4 and therefore the argument set forth above with respect to claim 4 are equally applicable to the recitations of claim 5. As such, the '791 reference cannot anticipate the subject matter of claim 5.

Regarding claim 6, the lens first recited in claim 4 is further defined as any one of a semicircular pillar shape, a prismatic shape, or a partial circular pillar shape having a Fresnel lens surface. As stated above, the '791 reference fails to teach or suggest the lens recited in claim 4. As such, the '791 reference also fails to teach the further defined lens of dependent claim 6.

Regarding claim 7, the lens first recited in claim 4 is further defined as being provided adjacent the light receiving plane of the light guide. Inasmuch as the '791 reference fails to teach the lens of claim 4, the '791 reference also fails to teach the further defined lens of claim 7.

Regarding claim 14, the lens first introduced in claim 5 is further defined as being any one of a semicircular pillar shape, a prismatic shape, or a partial circular pillar shape having a Fresnel lens surface. Inasmuch as the '791 reference fails to teach the lens of claim 5, the '791 reference also fails to teach the further defined lens of claim 14.

Regarding claim 15, the lens first introduced in claim 5 is further defined as being provided adjacent the light receiving plane of the light guide. Inasmuch as the '791 reference fails to teach the lens of claim 5, the '791 reference also fails to teach the further defined lens of claim 15.

Claims 8-12 and 16-18 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Shinohara, et al. (U.S. Patent No. 6,231,200). This rejection is respectfully traversed.

Regarding claim 8, an illumination device is called for which supplies light to a liquid crystal panel. The illumination device comprises a light source device which emits light, and a light guide having a light receiving plane which receives light from the light source device. The light source device comprises a light emitting device and a lens which receives the light emitted from the light emitting device. The office action states that the '200 reference discloses an illumination device 102 including a light source device 54 and a light guide 52. The office action then identifies a lens 103 but does not identify the lens 103 as being part of the light source device as claimed. That is, while the lens 103 is a part of the illumination device 102, the lens 103 is not part of the light source device 54 as claimed.

As illustrated in Fig. 2 of applicant's specification, a light source device 21 is provided with a light emitting device 43 and a lens 44a. The lens 44a is positioned adjacent a light receiving end 4a of a light guide 4. Advantageously, the claimed lens 44a of the light source 21 sets the directivity of the light exiting from the light source device to be high in the height direction in which the dimension of the light receiving plane of the light guide is small, and thus, the light from the light source device can be incident on the light guide as much as possible, thereby improving the efficiency of incidence of light on the light guide. Also, the directivity of the exiting light is set to be low in the width direction in which the dimension of the light receiving plane of the light guide is large, and thus uniformity of luminous intensity can be achieved. The '200

reference fails to do this because the light source 54 is shaped as a tube and only consists of a light emitting device with no lens. The lens 103 of the '200 reference cannot reasonably be interpreted as comprising part of the light source 54.

Regarding claim 9, an illumination device is called for which comprises a light source device which emits light and a light guide having a light receiving plane which receives light from the light source device. The light source device comprises a light emitting device and a lens which receives the light emitted from the light emitting device. These elements are the same as those recited in claim 8. As such, the arguments set forth above with respect to claim 8 are equally applicable to these recitations in claim 9. As such, the '200 reference cannot anticipate this subject matter.

Regarding claim 10, the lens first introduced in claim 8 is further defined as having one of a semicircular pillar shape, a prismatic shape, or a partial circular pillar shape having a Fresnel lens surface. Inasmuch as the '200 reference fails to teach the lens of claim 8, the '200 reference also fails to teach the further defined lens of claim 10.

Regarding claim 11, the lens first introduced in claim 8 is further defined as being provided adjacent the light receiving plane of the light guide. Inasmuch as the '200 reference does not teach the lens of claim 8, the '200 reference also fails to teach the further defined lens of claim 11.

Regarding claim 16, the lens first introduced in claim 9 is further defined as having any one of a semicircular pillar shape, a prismatic shape, or a partial circular pillar shape having a Fresnel lens surface. Inasmuch as the '200 reference fails to teach the lens of claim 9, the '200 reference also fails to teach the further defined lens of claim 16.

Regarding claim 17, the lens first introduced in claim 9 is further defined as being provided adjacent the light receiving plane of the light guide. Inasmuch as the '200 reference fails to teach the lens of claim 9, the '200 reference also fails to teach the further defined lens of claim 17.

REJECTION UNDER 35 U.S.C. § 103

Claims 12 and 18 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Shinohara in view of Kawachi, et al. (U.S. Pat. No. 6,220,741). This rejection is respectfully traversed.

Claim 12 calls for the liquid crystal device according to claim 8 to further comprise a control circuit. Inasmuch as the '200 reference (Shinohara) fails to teach the liquid crystal device of claim 8, the '200 reference also fails to teach the further defined liquid crystal device of claim 12.

Regarding claim 18, the liquid crystal device according to claim 9 is further defined as including a control circuit. Inasmuch as the '200 reference fails to teach the liquid crystal device of claim 9, the '200 reference also fails to teach the further defined liquid crystal device of claim 18.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

Dated: Dec 9, 2002

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ATTACHMENT FOR SPECIFICATION AMENDMENTS

The following is a marked up version of each replacement paragraph and/or section of the specification in which underlines indicates insertions and brackets indicate deletions.

[0051] Fig. [12] 7(c) shows a light source device according to another embodiment of the present invention. The light source device 41C shown in the drawing is different from the light source device 41A shown in Fig. 7(a) in that a pillar member having a partial circular pillar shape having a Fresnel lens surface, is used as a lens 44C. The same member as those shown in Fig. 7(a) are denoted by the same reference numerals, and a description thereof is omitted. In this embodiment, the base 42 and the lens 44C may be formed separately and then bonded together, or may be formed integrally.

ATTACHMENT FOR CLAIM AMENDMENTS

The following is a marked up version of each amended claim in which underlines indicates insertions and brackets indicate deletions.

1. (Amended) A light source device comprising:

a light emitting device; and

a lens which receives the light emitted from the light emitting device, wherein the lens [is a lens having] has a property that provides directivity of exiting light in one direction that is higher than directivity of exiting light in a direction perpendicular to the one direction;

wherein the lens has a planar light incidence plane which receives the light emitted from the light emitting device and a non-planar light exiting plane which exits the light received from the light emitting device.

2. (Amended) A light source device comprising:

a light emitting device; and

a lens [which receives the light emitted from the light emitting device], wherein the lens has a planar light incidence plane which receives the light emitted from the light emitting device and a non-planar light exiting plane which exits the light received from the light emitting devise, the non-planar light exiting plane having a shape in which a height from the light incidence plane changes in one direction, while a height from the light incidence plane is constant in a direction perpendicular to the one direction.

4. (Amended) An illumination device comprising:

a light source device which emits light; and

a light guide having a light receiving plane which receives light from the light source device [by a light receiving plane] and [causes light to exit from] a light exiting plane which exits the light;

wherein the light source device comprises a light emitting device and a lens which receives the light emitted from the light emitting device;

wherein the lens [is a lens having] has a property that provides directivity of exiting light in one direction that is higher than directivity of exiting light in a direction perpendicular to the one direction, the one direction [in which the exiting light has higher directivity] being set to a height direction of the light guide, and the perpendicular direction [in which the exiting light has lower directivity] being set to a width direction of the light guide.

5. (Amended) An illumination device comprising:

a light source device which emits light; and

a light guide having a light receiving plane which receives light from the light source device [by a light receiving plane] and [causes light to exit from] a light exiting plane which exits the light;

wherein the light source device comprises a light emitting device, and a lens which receives the light emitted from the light emitting device;

wherein the lens has a planar light incidence plane and a non-planar light exiting plane having a shape in which a height from the light incidence plane changes in one direction, while a height from the light incident plane is constant in a direction perpendicular to the one direction, the one direction being set to a height direction of the light guide, and the perpendicular direction being set to a width direction of the light

guide.

7. (Amended) The illumination device according to Claim 4, wherein the lens is provided [on] adjacent the light receiving plane of the light guide, for condensing light.

8. (Amended) A liquid crystal device comprising:

a liquid crystal panel comprising a liquid crystal held between a pair of substrates; and

an illumination device for supplying light to the liquid crystal panel;

wherein the illumination device comprises a light source device which emits light, and a light guide having a light receiving plane which receives light from the light source device [by a light receiving plane] and [causes light to exit from] a light exiting plane which exits the light; and

the light source device comprises a light emitting device and a lens which receives the light emitted from the light emitting device;

wherein the lens [is a lens having] has a property that provides directivity of exiting light in one direction that is higher than directivity of exiting light in a direction perpendicular to the one direction, the one direction in which the exiting light has higher directivity being set to a height direction of the light guide, and the perpendicular direction in which the exiting light has lower directivity being set to a width direction of the light guide.

9. (Amended) A liquid crystal device comprising:

a liquid crystal panel comprising a liquid crystal held between a pair of substrates; and

an illumination device for supplying light to the liquid crystal panel;

wherein the illumination device comprises a light source device which emits light, and a light guide having a light receiving plane which receives light from the light source device [by a light receiving plane] and [causes light to exit from] a light exiting plane which exits the light; and

the light source device comprises a light emitting device, and a lens which receives the light emitted from the light emitting device;

wherein the lens has a planar light incidence plane and a non-planar light exiting plane having a shape in which a height from the light incidence plane changes in one direction, while a height from the light incidence plane light incidence plane is constant in a direction perpendicular to the one direction, the one direction being set to a height direction of the light guide, and the perpendicular direction being set to a width direction of the light guide.

11. (Amended) The liquid crystal device according to Claim 8, wherein the lens is provided [on] adjacent the light receiving plane of the light guide, for condensing light.

15. (Amended) The illumination device according to Claim 5, wherein the lens is provided [on] adjacent the light receiving plane of the light guide, for condensing light.

17. (Amended) The liquid crystal device according to Claim 9, wherein the lens is provided [on] adjacent the light receiving plane of the light guide, for condensing light.